$Pd_{20}Mn_{80}$, $Cr_{50}Mn_{50}$, $Pd_{23}Mn_{77}$ according to the comparison examples was 50% of the initial value; the intensity of the conventional exchange coupled film with γ-FeMn was 10% of the initial value; and the intensity of film according to the Embodiment 8 was 90% or higher than the initial value.

What is claimed is:

1. A magnetoresistance effect element, comprising:

a substrate;

an exchange coupled film, formed on said substrate, comprising an antiferromagnetic layer and a ferromagnetic layer at least part of which is laminated with said antiferromagnetic layer;

electrodes for providing an electric current to said ferromagnetic layer, wherein said antiferromagnetic layer comprises $Cr_{100-x}M_x$, where M is at least one selected from the group consisting of Ga, In, Cu, Rh, Pt, Pd, Ag, Os, Ir, and Co; and

x is in the range of $0<x<30$.

2. The magnetoresistance effect element as set forth in claim 1,

wherein said electrodes comprise at least one selected from the group consisting of Cu, Ag, Au, Al and alloys thereof.

3. The magnetoresistance effect element as set forth in claim 1,

wherein x is in the range of $1 \leqq x \leqq 10$.

4. The magnetoresistance effect element as set forth in claim 1,

wherein M is Co.

5. The magnetoresistance effect element as set forth in claim 4,

wherein x is in the range of $1 \leqq x \leqq 10$.

6. The magnetoresistance effect element as set forth in claim 1,

wherein M is at least one selected from the group consisting of Cu, Rh, Pt, Pd, Ag, Os, and Ir.

7. The magnetoresistance effect element as set forth in claim 6,

wherein x is in the range of $1 \leqq x \leqq 10$.

8. The magnetoresistance effect element as set forth in claim 1,

wherein said antiferromagnetic layer has a Neel temperature in the range of 100°–500° C.

9. The magnetoresistance effect element as set forth in claim 1,

wherein a thickness of said antiferromagnetic layer is larger than that of said ferromagnetic layer.

10. The magnetoresistance effect element as set forth in claim 1, further comprising:

an interlayer disposed at an interface of said antiferromagnetic layer and said ferromagnetic layer, said interlayer being made of at least one selected from the group consisting of a γ-Mn alloy, a Co-Cr alloy, Cu, Ru, Rh, Re, Pt, Pd, Ag, Au, Os, and Ir, wherein the thickness of said interlayer is 5 nm or less.

* * * * *

11. A magnetoresistance effect element comprising

a spin valve film having a first ferromagnetic layer and an antiferromagnetic layer, the antiferromagnetic layer comprising an alloy of PtMn.

12. A magnetoresistance effect element as set forth in claim 11, wherein said alloy is represented by $Pt_{100-x}Mn_x$, where x is an atomic % number in the range of $24 \leq x \leq 75$.

13. A magnetoresistance effect element as set forth in claim 11, wherein said alloy is represented by $Pt_{100-x}Mn_x$, where x is an atomic % number in the range of $40 < x \leq 70$.

14. A magnetoresistance effect element as set forth in claim 11, wherein said alloy is represented by $Pt_{100-x}Mn_x$, where x is an atomic % number in the range of $24 \leq x \leq 35$.

15. A magnetoresistance effect element as set forth in claim 12, wherein said alloy further comprises at least one element N´selected from the group consisting of Fe, Co, Pd, and Ni.

16. A magnetoresistance effect element as set forth in claim 15, wherein said alloy has a ratio between Pt and N´ represented by $Pt_{100-y}N'_y$, where y is an atomic % number in the range of $0 < y < 30$.

17. A magnetoresistance effect element as set forth in claim 11, wherein said alloy has a tetragonal crystalline structure.

18. A magnetoresistance effect element as set forth in claim 11, wherein the first ferromagnetic layer comprises a metal selected from the group consisting of Fe, Ni, Co, FeNi, FeCo, FeCoNi, and an alloy thereof.

19. A magnetoresistance effect element as set forth in claim 11, wherein the antiferromagnetic layer has a film thickness larger than that of the first ferromagnetic layer.

20. A magnetoresistance effect element as set forth in claim 11, wherein said alloy further comprises at least one element M´selected from the group consisting of transition metals, rare earth metals, and half metals.

21. A magnetoresistance effect element as set forth in claim 11, further comprising a nonmagnetic layer on the first ferromagnetic layer, and a second ferromagnetic layer on the non-magnetic layer, wherein the non-magnetic layer is provided between the first and second ferromagnetic layers.

22. A magnetoresistance effect element as set forth in claim 11, wherein PtMn is represented by $Pt_{100-x}Mn_x$, where x is an atomic % number in the range of $40 < x \leq 75$.

23. A magnetoresistance effect element as set forth in claim 16, wherein y is an atomic % number in the range of $1 \leq y \leq 10$.

24. A magnetoresistance effect element as set forth in claim 16 further comprising a nonmagnetic layer on the first ferromagnetic layer, and a second ferromagnetic layer on the non-magnetic layer, wherein the non-magnetic layer is provided between the first and second ferromagnetic layers.

25. A magnetoresistance effect element as set forth in claim 20, further comprising a nonmagnetic layer on the first ferromagnetic layer, and a second ferromagnetic layer on the non-magnetic layer, wherein the non-magnetic layer is provided between the first and second ferromagnetic layers.

26. A magnetoresistance effect element, comprising

an exchange coupled film having a first ferromagnetic layer and an antiferromagnetic layer, the antiferromagnetic layer being on the first ferromagnetic layer, and the exchange coupled film being substantially free of corrosive pits, when the exchange film is exposed to an atmosphere having a relative humidity of 90%, at a temperature of 90 degrees centigrade for a time duration of 48 hours.

27. A magnetoresistance effect element as set forth in claim 26, wherein the exchange coupled film has less than a 10% probability for occurrence of corrosive pits.

28. A magnetoresistance effect element as set forth in claim 26 wherein the antiferromagnetic layer comprises an alloy of NMn, where N is at least one element selected from the group consisting of Cu, Ru, Rh, Re, Pd, Pt, Ag, Au, Os, and Ir.

29. A magnetoresistance effect element as set forth in claim 26 wherein the antiferromagnetic layer comprises an alloy of CrM, where M is at least one element selected from the group consisting of Ga, In, Cu, Rh, Pt, Pd, Ag, Os, Ir, and Co.

30. A magnetoresistance effect element, comprising

a spin valve film having a first ferromagnetic layer, an antiferromagnetic layer, and an interlayer,

the interlayer being between the antiferromagnetic layer and the first ferromagnetic layer.

31. A magnetoresistance effect element, as set forth in claim 30, wherein the interlayer is made of a material selected from a γ ~ Mn alloy, a Co-Cr alloy, Cu, Ru, Rh, Re, Pt, Pd, Ag, Au, Os and Ir.

32. A magnetoresistance effect element as set forth in claim 31, wherein the interlayer has a thickness of 5nm or less.

33. A magnetoresistance effect element as set forth in claim 30, wherein the antiferromagnetic layer comprises an alloy of NMn, where N is at least one element selected from the group consisting of Cu, Ru, Rh, Re, Pd, Pt, Ag, Au, Os, and Ir.

34. A magnetoresistance effect element as set forth in claim 30, wherein the antiferromagnetic layer comprises an alloy of CrM, where M is at least one element selected from the group consisting of Ga, In, Cu, Rh, Pt, Pd, Ag, Os, Ir, and Co.

35. A magnetoresistance effect element, comprising

a spin valve film having a first ferromagnetic layer and an antiferromagnetic layer, the antiferromagnetic layer being on the first ferromagnetic layer, the antiferromagnetic layer comprising an alloy of PtMn, wherein the antiferromagnetic layer is formed by heating in a magnetic field to provide unidirectional anisotropy.

36. A magnetoresistance effect element, comprising

an exchanged coupled film having a first ferromagnetic layer and an antiferromagnetic layer, the antiferromagnetic layer being on the first ferromagnetic layer, wherein the antiferromagnetic layer has an orientation of (101).

37. A magnetoresistance effect element, comprising

a spin valve film having a first ferromagnetic layer and an antiferromagnetic layer, the antiferromagnetic layer comprising an alloy of PdMn.

38. A magnetic head comprising a magnetoresistance effect element as set forth in claim 11.